

REMARKS

In the Office Action the Examiner noted that claims 1-33 are pending in the application, and the Examiner rejected all claims. By this Amendment, claims 1-13 have been cancelled, and claim 15 has been amended. No new matter has been presented. Thus, claims 14-33 are pending in the application. The Examiner's rejections are traversed below, and reconsideration of all rejected claims is respectfully requested.

Claims of Priority

In items 3-4 on page 2 of the Office Action, the Examiner acknowledged the Applicants' claim for foreign priority based on Japanese patent application 11-341077, filed on November 30, 1999, and Japanese patent application 11-309598, filed on October 29, 1999, but noted that the Applicants have not filed certified copies of these applications.

The Applicants respectfully submit that the current application is a divisional application of U.S. Patent Application Serial No. 09/678,732, now U.S. Patent No. 6,681,280. The Applicants further respectfully submit that certified copies of the applications to which the subject application claims priority were submitted with application serial no. 09/678,732, to which the subject application claims priority.

Double Patenting

In item 6 on page 3 of the Office Action the Examiner rejected claims 1-13 under 35 U.S.C. §101 as claiming the same invention as that of claims 1-13 of U.S. Patent No., 6,681,280. The Examiner stated that this is a double patenting rejection.

By this Amendment, claims 1-13 have been cancelled.

Claim Rejections Under 35 USC §112

In items 13-15 on page 3 of the Office Action the Examiner rejected claims 15-20 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. The Examiner listed an antecedent basis problem with claim 15 as being the basis of these rejections.

By this Amendment, claim 15 has been amended to correct the antecedent basis problem. Therefore, the Applicants respectfully request the withdrawal of the Examiner's §112 rejections of claims 15-20.

Claim Rejections Under 35 USC §102

In items 17-25 on pages 4-12 of the Office Action the Examiner rejected claims 14-20 and 33 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,165,027, issued to Krauskopf (hereinafter referred to as "Krauskopf"). The Applicants respectfully traverse the Examiner's rejections of these claims.

Claim 14 of the present application recites "controlling a break-interrupt on the basis of a breakpoint detection result from said break detection section and a determination result from said condition determination section." In other words, the break-interrupt is controlled according to both the breakpoint detection result and the determination result. The Applicants respectfully submit that Krauskopf does not disclose or suggest at least these features of claim 14.

Krauskopf is directed to a breakpoint apparatus incorporated in a single chip microprocessor. The apparatus permits breakpoints on specific references to either program instructions or data. According to Krauskopf, the apparatus includes a logic circuit for determining whether the reference represented by the breakpoint address overlaps a current virtual address. The breakpoint signal is provided by output from an AND gate. See Krauskopf, column 5, lines 1-8.

The Applicants respectfully submit that the "AND" gate of Krauskopf, cited by the Examiner as disclosing the discussed feature of claim 14, simply combines three signals. See Krauskopf, column 5, lines 1-8. In contrast to the present invention, the "AND" gate of Krauskopf does not control a break-interrupt on the basis of a breakpoint detection result as well as a determination relating to whether a condition of a conditional instruction is satisfied.

In fact, Krauskopf does not provide any information regarding a conditional instruction. Krauskopf indicates that the AND gate receives two signals based on "matching" and a clock enable signal, none of which relate to conditional instructions. The disclosure of Krauskopf merely discloses a hardware implement for determining whether or not a break is to occur according to memory access (fetching instruction, data access).

This is in direct contrast to claim 14 of the present application, which recites "controlling a break-interrupt on the basis of a breakpoint detection result from said break detection section

and a determination result from said condition determination section.” By controlling the break-interrupt as recited in claim 14, it is possible to control whether or not a break-interrupt is to occur not only on the basis of the detection result of a breakpoint, but also on the basis of the determination result of the condition determination section. Therefore, using the interrupt control apparatus recited in claim 14, when debugging a program including a conditional instruction, it is possible to control whether or not the break-interrupt is to occur in accordance with whether or not the condition of the conditional instruction is satisfied. Thus, when the condition of the conditional instruction is satisfied, the program execution is interrupted. However, when the condition of the conditional instruction is not satisfied, no interruption of the program execution will be performed.

Therefore, Krauskopf does not disclose at least the feature of “controlling a break-interrupt on the basis of a breakpoint detection result from said break detection section and a determination result from said condition determination section.” Accordingly, Krauskopf does not disclose every element of the Applicants' claim 14. In order for a reference to anticipate a claim, the reference must teach each and every element of the claim (MPEP §2131). Therefore, since Krauskopf does not disclose the features recited in independent claim 14, as stated above, it is respectfully submitted that claim 1 patentably distinguishes over Krauskopf, and withdrawal of the §102(b) rejection is earnestly and respectfully solicited.

Claim 15 of the present application recites sending a break-interrupt notification in accordance with an AND operation result performed on a detection signal output from an instruction break detection section and a determination signal output from a condition determination section. As discussed above in regard to claim 14, Krauskopf does not disclose or suggest at least this feature of claim 15. Therefore, the Applicants respectfully submit that claim 15 also patentably distinguishes over Krauskopf.

Claims 16-20 depend from claim 15 and include all of the features of that claim plus additional features which are not disclosed or suggested by Krauskopf. Therefore, it is respectfully submitted that claims 16-20 also patentably distinguish over Krauskopf.

Claim 33 of the present application recites “controlling the break-interrupt on the basis of a detection result of said breakpoint and a determination result of said conditional instruction.” As discussed above in regard to claim 14, Krauskopf does not disclose or suggest at least this feature of claim 33. Therefore, the Applicants respectfully submit that claim 33 also patentably distinguishes over Krauskopf.

In items 26-36 on pages 12-19 of the Office Action the Examiner rejected claims 21-32 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,480,818, issued to Alverson et al. (hereinafter referred to as "Alverson"). The Applicants respectfully traverse the Examiner's rejections of these claims.

Claim 21 of the present application recites "a control section for, in an interrupt handler activated in accordance with said break-interrupt notification supplied from said instruction break detection section, determining whether or not a condition of said conditional instruction is satisfied, and controlling break-interrupt processing in accordance with a determination result." In other words, the break-interrupt processing is controlled according to both the break-interrupt notification and the determination result of whether or not the condition of the conditional instruction is satisfied. The Applicants respectfully submit that Alverson does not disclose or suggest at least these features of claim 21.

Alverson discloses debugging techniques which are useful in a multithread environment. One of the techniques used includes implementing breakpoints using out-of-line instruction emulation to prevent a need for an instruction replaced with a breakpoint instruction to be returned to its original location for single-step execution. However, similar to Krauskopf discussed previously in this Amendment, although Alverson discloses that actions such as the evaluating of expressions or conditions occur, Alverson does not determine whether *a condition of a conditional instruction* is satisfied. Determining whether a condition of a conditional instruction is satisfied is not tantamount to simply evaluating conditions.

Therefore, the techniques disclosed in Alverson are in direct contrast to the interrupt control apparatus recited in claim 21, which includes "a control section for, in an interrupt handler activated in accordance with said break-interrupt notification supplied from said instruction break detection section, determining whether or not a condition of said conditional instruction is satisfied, and controlling break-interrupt processing in accordance with a determination result." Thus, the Applicants respectfully submit that claim 21 patentably distinguishes over Alverson, and respectfully requests the withdrawal of the Examiner's §102(e) rejection.

Claims 22-26 depend from claim 21 and include all of the features of that claim plus additional features which are not disclosed or suggested by Alverson. Therefore, it is respectfully submitted that claims 22-26 also patentably distinguish over Alverson.

Claim 27 of the present application recites "a control section for, in an interrupt handler activated in accordance with said break-interrupt notification supplied from said software break detection section, determining whether or not a condition of said conditional instruction is

satisfied, and controlling break-interrupt processing in accordance with a determination result." As discussed above in regard to claim 21, Alverson does not disclose or suggest at least these features of claim 27. Therefore, it is respectfully submitted that claim 27 also patentably distinguishes over Alverson.

Claims 28-32 depend from claim 27 and include all of the features of that claim plus additional features which are not disclosed or suggested by Alverson. Therefore, it is respectfully submitted that claims 28-32 also patentably distinguish over Alverson.

Summary

In accordance with the foregoing, claims 1-13 have been cancelled, and claim 15 has been amended. No new matter has been presented. Thus, claims 14-33 are pending and under consideration.

There being no further outstanding objections or rejections, it is respectfully submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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